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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

FCC REPORT AND RECOMMENDATIONS

OF THE

UNLICENSED PCS AD HOC COMMITTEE FOR 2 GHZ MICROWAVE TRANSITION AND MANAGEMENT

May 14, 1993

by

**WILEY, REIN & FIELDING
1776 K Street, N.W.
Washington, D.C. 20006
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EXECUTIVE SUMMARY

The Federal Communications Commission has proposed allocating spectrum for important new unlicensed Personal Communications Services ("PCS"). This allocation recognizes that unlicensed PCS can greatly improve the nation's telecommunications infrastructure and bring enormous benefits to the American public in several major respects:

- Unlicensed PCS consists of wireless data, voice and messaging devices and systems operating at low power with high portability. Unlike licensed PCS, which is focused primarily on wide area service, this service fills an unmet need for "on-site" or campus wide service. Unlicensed PCS is generally expected to accommodate user owned and operated devices, with no airtime charges for usage.
- There is a substantial and documented consumer demand for unlicensed PCS that is growing rapidly. Unlicensed PCS represents a market for millions of devices worth billions of dollars.
- Domestically, unlicensed PCS will provide tremendous opportunities for U.S. manufacturers to improve the nation's telecommunications infrastructure with resulting enhancements in business productivity and the overall quality of life.
- Internationally, deployment of unlicensed PCS will enable the United States to maintain its leadership position in the global telecommunications market.

The Unlicensed PCS Ad Hoc Committee for 2 GHz Microwave Transition and Management ("UTAM" or "Committee") has been formed to address the myriad of challenges associated with the relocation of microwave licensees and the coordination of early deployment of unlicensed PCS. The Committee, composed of representatives of a broad range of large and small companies related to computing, telecommunications and business equipment, is committed to ensuring that microwave users are protected from interference and relocated consistent with Commission requirements so that timely deployment of unlicensed PCS can occur. This requires solutions to some major problems:

- The unlicensed PCS industry must find funding for a multimillion dollar undertaking, the relocation and compensation of hundreds of microwave licensees in the proposed unlicensed PCS spectrum.

- During the relocation process, the unlicensed PCS industry must ensure that early deployment of unlicensed PCS does not cause interference to incumbent microwave licensees.
- The unlicensed PCS industry must assume responsibility for managing the relocation process, satisfying microwave licensee concerns and resolving any disputes.
- A system of ensuring equitable unlicensed PCS industry participation in the funding and management of these responsibilities is essential.

The purpose of this *Report* is to propose a consensus-based solution to these problems.

Specifically, the Committee recommends that the FCC:

- Endorse establishment of an open industry entity to assume relocation and spectrum management functions pursuant to Section 332 of the Communications Act;
- Require, under the Commission's equipment authorization rules, that all unlicensed device manufacturers contribute equitably to the entity's cost compensation fund; and
- Permit early deployment of "non-nomadic" unlicensed PCS devices and systems on an entity managed spectrum sharing basis prior to complete band clearing.

Submitted with this *Report* are proposed rules to govern deployment of unlicensed PCS devices and systems. The Committee requests that the Commission place these rules on public notice for comment by interested parties and that it move promptly for their adoption. Timely FCC action to endorse an industry-wide entity to manage the relocation process and to adopt the Committee's recommendations is essential to realize the tremendous potential of unlicensed Personal Communications Services.

I. INTRODUCTION

In its Personal Communications Services ("PCS") proceedings, GEN Docket No. 90-314, the Federal Communications Commission ("FCC" or "Commission") has proposed allocating spectrum for new unlicensed Personal Communications Services. This allocation is intended to "foster the rapid introduction of new PCS technologies by permitting manufacturers to experiment with, and directly market to the general public, products using new designs and technologies, without the delays associated with the licensing of a radio service."¹

"Unlicensed Personal Communications Services" encompass a diverse array of highly portable and mobile wireless data, voice and messaging devices and systems that operate at low power.² These products and services include Data-PCS, laptops, PBXs, wireless telephony office systems, and a variety of other in-building or "on site" business and consumer-oriented applications.

Unlike licensed PCS which generally focuses on wide area service, unlicensed PCS fills a void for "on-site" or campus wide service, without a requirement for incurring airtime charges. Portable units may talk directly to other portable units or through a site located system. With the need for licensing and attendant delay removed, prospective customers will be able to purchase equipment with ease and convenience.

There is currently a substantial consumer demand for flexible and innovative new unlicensed PCS offerings representing a market of millions of devices worth billions of dollars. Moreover, the demand is growing as consumers increasingly look to new unlicensed technologies to fill their needs for sophisticated yet affordable wireless communications products and services suitable for use in a mobile and transient environment. There are several published market

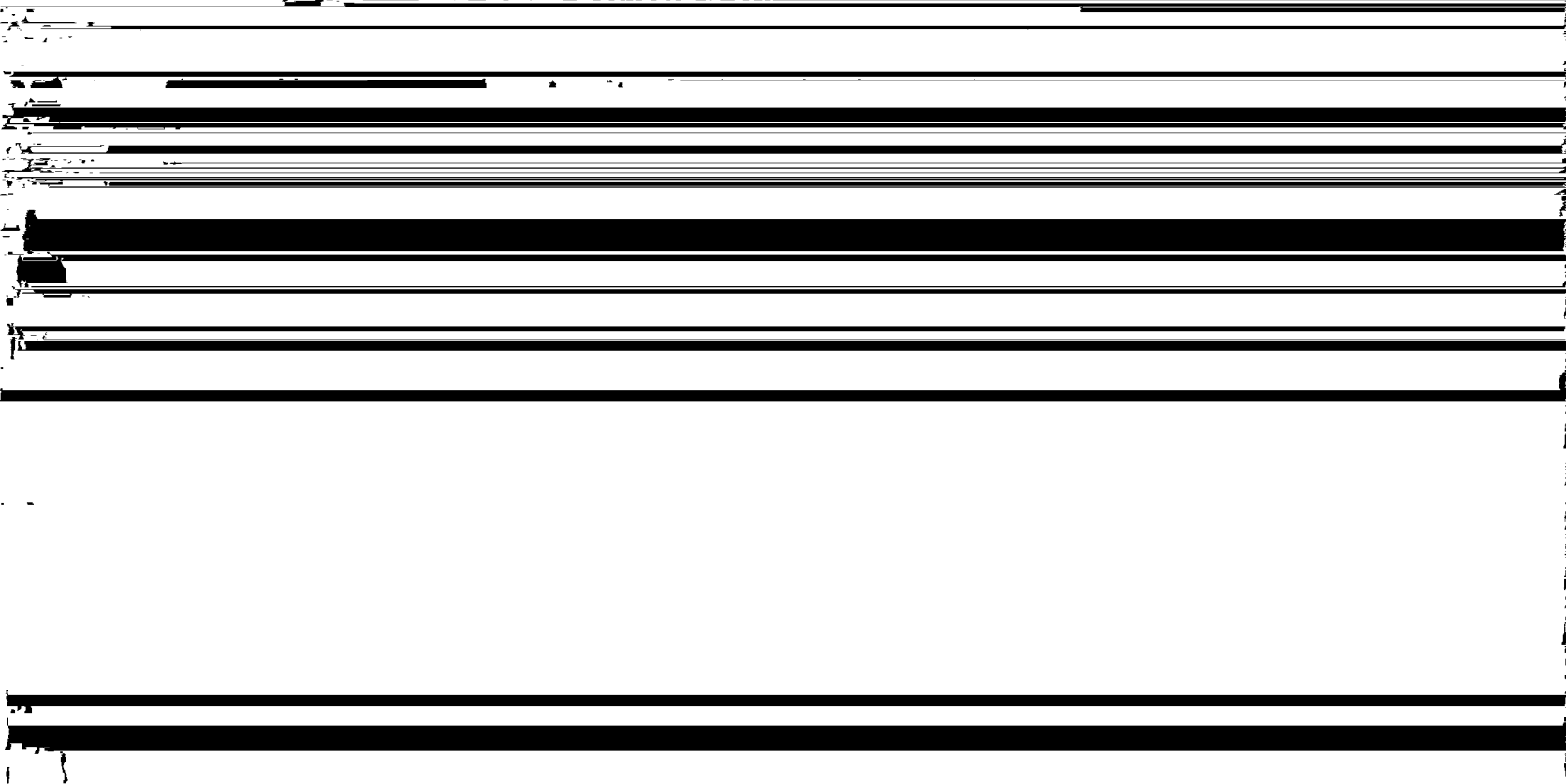
¹ *Amendment of the Commission's Rules to Establish New Personal Communications Services*, 7 FCC Rcd 5676, 5693 (1992) (Notice of Proposed Rule Making) [hereinafter "PCS NPRM"].

² The FCC has identified wireless PBXs, high and low speed data and cordless phones as representative unlicensed applications. *Id.*

research reports, as well as comments filed with the FCC, that project a dramatic growth in demand for in-building wireless office systems, such as wireless PBXs during the decade.³

Unlicensed PCS offers tremendous public benefits. Deployment of these new technologies provides opportunities for United States manufacturers to improve the nation's telecommunications infrastructure, offering expanded networks and services to better meet the nation's communications needs. Unlicensed PCS will bring the benefits of untethered access to millions of telecommunications customers in office and other workplace environments. Deployment of these services and products will help to strengthen the American economy by increasing productivity and creating a variety of new jobs and opportunities in the telecommunications industry. Moreover, implementation of unlicensed PCS will foster American competitiveness abroad and promote continued American leadership in global telecommunications markets.

Before the deployment of unlicensed PCS can become reality, several complex issues must be resolved. The newly proposed unlicensed spectrum is currently home to hundreds of licensed 2 GHz microwave facilities that must be relocated before unlicensed PCS can be deployed. Under FCC policies, microwave licensees are entitled to cost compensation and comparable alternative facilities before being relocated from the unlicensed PCS band. However, because unlicensed PCS



The Unlicensed PCS Ad Hoc Committee for 2 GHz Microwave Transition and Management has been formed to address these challenges.⁴ The purpose of this *Report* is to present the FCC with the Committee's findings concerning the difficulties posed by the existing transition framework for 2 GHz relocations and to recommend a consensus-based solution. Specifically, the Committee endorses the formation of an open industry entity, structured along the lines of a nonprofit corporation, to manage the relocation process.

The "Entity" would be recognized by the FCC as a frequency coordinator pursuant to Section 332 of the Communications Act. No unlicensed device would be sold or marketed unless it has received approval from the FCC under the agency's equipment authorization rules. These rules would mandate participation in the Entity's relocation cost compensation fund and compliance with frequency coordination and non-interference requirements before complete band clearing⁵ occurs. Contributions from participating members would be assessed on an equitable basis whereby all beneficiaries of the band clearing would pay a fair share of the costs.⁶

The Committee also recommends that FCC rules permit deployment of "non-nomadic" unlicensed PCS devices and systems on a spectrum sharing basis prior to complete band clearing. Early deployment would enable the American public to benefit sooner rather than later from important and useful new unlicensed offerings. It would also permit interim "market making" essential to raising sufficient revenue to undertake financing microwave relocations immediately.

⁴ UTAM is an organization that is separate and distinct from the Wireless Information Networks Forum ("WINForum"). The Committee has been formed to promote the establishment of an industry-wide entity to manage the microwave relocation process and to resolve interservice interference (*i.e.*, interference between unlicensed PCS devices and systems and 2 GHz microwave licensees prior to full band clearing). WINForum, in its capacity as the unlicensed device industry's trade association, is developing a "spectrum etiquette" or set of known interactive behaviors designed to address intraservice interference (*i.e.*, interference between and among unlicensed PCS devices). See Comments of WINForum, GEN Docket 90-314 at 1-2 (filed Nov. 9, 1992).

⁵ The term "band clearing," as used throughout this *Report*, refers to that point in time at which interservice interference is no longer deemed a concern.

⁶ Several parties participating in the Emerging Technologies proceeding have advanced alternative approaches to the current relocation rules. For example, restriping has been discussed. See, *e.g.*, Comments of Apple Computer, Inc., ET Docket No. 92-9 at 7-10 (filed Jan. 13, 1993). Under any of these alternatives, the role of the proposed Entity would still be essential to ensuring cost compensation and relocation of incumbent microwave licensees.

II. WHAT IS THE UNLICENSED PCS AD HOC COMMITTEE FOR 2 GHZ MICROWAVE TRANSITION AND MANAGEMENT ("UTAM")?

Charter of the Committee The Committee is responsible for “develop[ing] review[ing]

Membership. Membership in the Committee is "open to any party with a material interest

manufacturers and users of unlicensed PCS, yet is the responsibility of none. This fundamental problem must be resolved before the industry can begin to tackle the multitude of difficulties it faces under the Commission's framework.

Commission requirements pose a number of substantial obstacles to the unlicensed device industry. *First*, there is a general industry consensus that co-existence between unlicensed PCS and fixed microwave systems is only possible for limited types of PCS devices — those “non-nomadic” devices utilizing a fixed infrastructure.¹⁰ In contrast, other unlicensed PCS devices are “nomadic,” lacking a fixed infrastructure and capable of roaming and operating virtually anywhere, without geographic limitation. The highly portable and mobile nature of “nomadic” devices in conjunction with the susceptibility of microwave operations to interference render spectrum sharing between these services impossible. Therefore, “[u]ltimately, there is a requirement for clear spectrum for the viable deployment of Unlicensed PCS.”¹¹

Second, band clearing on the scale dictated by the current transition framework will be both tremendously costly and time consuming. There are over 230 licensees operating more than 450 stations in the 1910-1930 MHz band alone.¹² Some 357 of these stations are subject to involuntary relocation at the expiration of the transition period whose length is yet to be determined.¹³ Moreover, the fact that another 95 public safety and governmental licensees are under no obligation to relocate will further complicate this process, as explained below.

Third, in light of the need for clear spectrum prior to full deployment of new unlicensed technologies, the industry is placed in the unenviable position of having to secure the up-front costs

¹⁰ The discussion of interim deployment of non-nomadic unlicensed PCS is set out at length in Section V, *infra*.

¹¹ Unlicensed PCS Ad Hoc Committee, Consensus Principle No. 1. A complete listing of UTAM's Consensus Principles is attached as Tab C.

¹² The reference to 1910-1930 MHz is for illustrative purposes only. Members of UTAM and WINForum have documented that more than 20 MHz of spectrum will be needed for unlicensed PCS.

¹³ Of course, the as yet unspecified length of the transition period during which incumbent 2 GHz microwave users may refuse to relocate is a further complicating factor. This is because the length of the transition will directly affect the timing of unrestricted access to the band by unlicensed PCS as well as the cost of securing voluntary relocation agreements.

of financing numerous relocations now for a business that will not exist for perhaps many years. Manufacturers must therefore grapple with the problems of how to "prove out" the market to ascertain future demand for their services, raise sufficient revenues to fund relocations, and expedite the delivery of new unlicensed technologies to the public.

The difficulties to be overcome in clearing spectrum to permit the deployment of unlicensed PCS systems are exacerbated by the FCC's determination to exempt public safety and government licensees in the 2 GHz band from any relocation requirement. As explained above, there is a consensus that clear spectrum is required before full deployment of unlicensed PCS can occur. However, because public safety and governmental links are under no obligation to relocate, such links may theoretically remain indefinitely in the band, delaying significantly or even ultimately thwarting deployment of new unlicensed PCS. Given this state of affairs, yet mindful of the compelling public interest in protecting the integrity of public safety and governmental operations, UTAM proposes that the FCC facilitate the transition and relocation process by granting "[p]roblematic 2 GHz links . . . priority access to the Federal Government spectrum at 1710 to 1850 MHz."¹⁴

Priority access may serve as an inducement for many otherwise exempt 2 GHz licensees to relocate, hastening band clearing and the availability of new unlicensed PCS. Prompt relocation to government spectrum is also likely to produce significant cost and time savings relative to the equipment, engineering, licensing and other activities involved. Moreover, relocation to this spectrum will afford public safety and government licensees significant opportunities to upgrade their systems, improving the overall quality of public safety communications. The FCC has already expressed its intention to work with the National Telecommunications and Information Administration ("NTIA") to explore ways to accommodate certain non-government 2 GHz fixed

¹⁴ See Unlicensed PCS Ad Hoc Committee, Consensus Principle No. 5.

microwave facilities in the 2 GHz government band.¹⁵ UTAM strongly endorses FCC initiatives in this regard and urges the Commission to encourage the proposed exempt licensees to negotiate relocation options in good faith.

Given this state of affairs and under the existing FCC framework governing microwave relocations, the unlicensed PCS industry's obligations are multi-faceted. Specifically, it must:

- Secure funding for the substantial costs associated with relocating existing microwave stations, which total many millions of dollars;
- Assume responsibility for managing the relocation process in a manner that provides full cost compensation and comparable alternative facilities in order to satisfy microwave licensee concerns;
- Ensure that any deployment of "non-nomadic" unlicensed PCS prior to complete band clearing will not cause interference to existing microwave licensees; and
- Assure equitable unlicensed PCS industry participation in the funding and management of these challenges.

The industry recognizes that these obligations must be met in full before deployment of unlicensed PCS can be realized. Timely, decisive action is required on the part of industry as well as the FCC in ensuring that these obligations can, in fact, be fulfilled. The industry's recommendations on an appropriate course of action and the FCC's proposed role in this process are detailed in the section that follows.

IV. A PROPOSED SOLUTION: ESTABLISHMENT OF AN OPEN INDUSTRY ENTITY

PCS devices and systems to prevent interference to fixed microwave operations and permit non-nomadic marketing prior to full band clearing.

Individual manufacturers would be required to become members of the Entity before marketing devices for use in the band and would be required to contribute their fair share to the Entity's cost recovery mechanism. This mechanism would be structured to ensure that all manufacturers, large and small, have an opportunity to participate in the unlicensed PCS market. In addition, in order to ensure that existing microwave operations are protected from harmful interference, the marketing, sale or operation of an unlicensed PCS device or system would be prohibited absent receipt of FCC equipment authorization.

Membership in the Entity would be enforced via the Commission's equipment approval rules and by FCC designation of the Entity as a frequency coordinator/spectrum manager under applicable provisions of the Communications Act. The Committee's recommendations regarding the Entity's legal structure and functions as well as appropriate enforcement mechanisms to ensure equitable participation by all industry members are detailed below.

A. Form and Legal Structure of Entity

The industry recommends that the Entity be created as an open consortium, configured along the lines of a nonprofit membership corporation or trade association. In accordance with the consensus principles adopted by the Committee, the Entity would be open and flexibly structured to permit participation by any party with a material interest in the relocation of microwave incumbents from the unlicensed band. This structure would allow a high degree of flexibility for entry and exit of members. Moreover, the Entity could be dissolved with relative ease once its primary purpose, the compensation and relocation of microwave licensees, is accomplished.

B. Mechanisms to Ensure Participation in Entity

FCC recognition of and support for the unlicensed PCS Entity is critical if the Entity is to obtain legitimacy and assume the tremendous responsibilities associated with a multimillion dollar relocation effort. The Committee strongly "supports FCC equipment authorization which requires

participation in the entity”¹⁶ by manufacturers as a condition of equipment approval for unlicensed devices. This is essential to ensure that all beneficiaries of the band clearing contribute their fair share and do not interfere with incumbent microwave operations. This requirement will avoid a “free rider” problem, whereby a manufacturer could contribute nothing to the relocation process but reap the benefits of band clearing undertaken by others.

C. Legal Authority To Recognize Entity

The Committee believes that the FCC possesses clear authority, both general and specific, to recognize an unlicensed PCS entity and mandate contributions to its compensation pool as a condition for securing approval to market, sell or operate unlicensed equipment. Stemming from the agency’s general authority to prevent interference with the use of the airwaves, the Commission’s equipment approval rules and specific statutory provisions permitting the establishment of frequency coordinators in the private land mobile services provide ample sources of power to adopt the proposals set out in this *Report*.

1. Equipment Approval

In order to promote efficient use of radio spectrum, the FCC may develop appropriate rules for a service and compel compliance with technical standards applicable to devices capable of emitting electromagnetic radiation and operating within that service. *See* 47 C.F.R. § 2.901 (1992). For example, the Commission could promulgate rules that provide that any unlicensed PCS devices operating in the unlicensed spectrum must secure equipment approval demonstrating compliance with designated emission and other standards.¹⁷ As the Committee has

¹⁶ *See* Unlicensed PCS Ad Hoc Committee, Consensus Principle No. 6.

¹⁷ The FCC’s broad authority under Title I and Title III of the Communications Act to promote efficient use of spectrum could also provide a basis for promulgating rules conditioning equipment approval on participation in the Entity. *See* 47 U.S.C. §151 *et seq*; 47 U.S.C. §301 *et seq*.

recommended, the rules could establish that one condition of such approval is participation in the cost compensation mechanism established by the Entity.¹⁸

2. Frequency Coordinator Under 47 U.S.C. § 332

In 1982, Congress amended the Communications Act to recognize the role frequency coordinators serve in the spectrum management process.¹⁹ Under Section 332 of the Communications Act, the Commission is authorized to recognize an entity to assist in the coordination and assignment of frequencies to stations in the private land mobile services and fixed services. *See* 47 U.S.C. § 332(b)(1). The role of the proposed Entity in clearing the unlicensed device spectrum and assisting in the prevention of interference to incumbent microwave licensees corresponds to the traditional role of a frequency coordinator.

The Commission's power to utilize a frequency coordinator in the instant situation is solidly grounded in Section 332's authorization of the use of frequency coordinating committees. As discussed below, this section, particularly when viewed in conjunction with the legislative history of the Act, provides ample authority for FCC endorsement of a frequency coordinator to manage the unlicensed PCS spectrum.

In the unlicensed PCS situation, the basic purpose of the coordinating Entity would be to ensure non-interference to fixed microwave services operating in the unlicensed PCS spectrum. Such a role is entirely consistent with the objectives of Section 332, which include the protection of "fixed services" from harmful interference. Moreover, to the extent that implementation of the Commission's proposed unlicensed PCS allocation depends on protection of existing microwave licensees, there is a compelling need for an Entity to perform the role proposed.


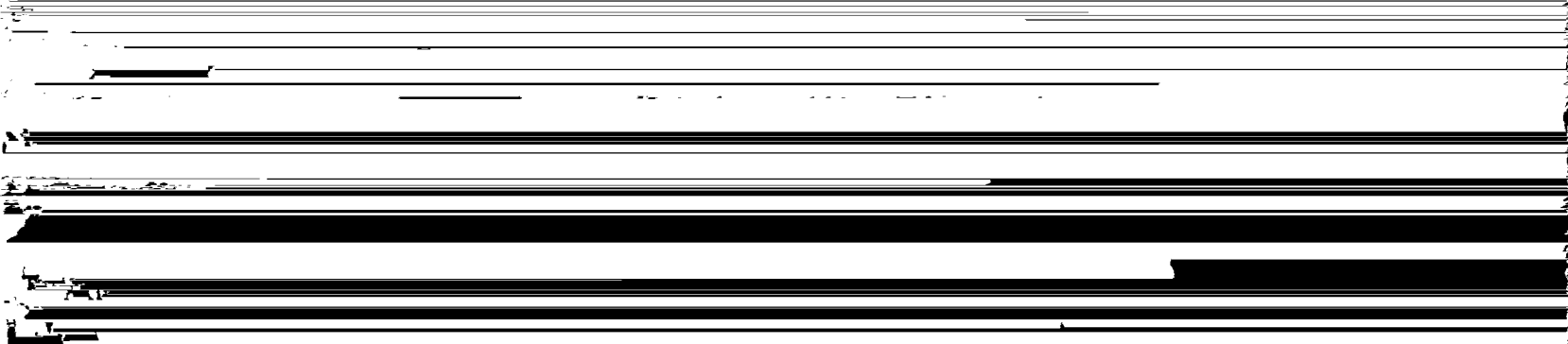
¹⁸ The Commission's rules should also incorporate an industry-developed "spectrum etiquette" to resolve intraservice interference concerns. Compliance with the etiquette would be a prerequisite to obtaining equipment approval of a device. As explained in note 4, *supra*, WINForum is currently developing spectrum etiquette(s) to resolve intraservice interference concerns.

¹⁹ The Communications Amendments Act of 1982, Pub.L. No. 97-259, 96 Stat. 1087. Section 331 of the Communications Act of 1934, as amended, is codified at 47 U.S.C. § 332 (1988).

The Entity would protect microwave licensees in two ways: (1) by ensuring that incumbent microwave licensees are fully compensated and relocated from the unlicensed PCS spectrum consistent with FCC relocation requirements; and (2) by coordinating the interim deployment of non-nomadic unlicensed PCS devices and systems prior to band clearing so as to ensure that incumbent microwave operations are not subject to harmful interference. These two functions are explored in greater detail immediately below.

First, the Entity will serve as the focal point for negotiating compensation and relocation arrangements with 2 GHz microwave licensees and resolving disputes arising from the relocation process. It will be responsible for collecting revenues from its members and distributing those funds to defray relocation costs. Moreover, the Entity could assist microwave licensees by performing tasks such as funding activities necessary for implementation of new facilities, financing the construction of new systems or their alternatives, testing for comparability and overseeing and/or managing construction of comparable alternative facilities.

The Entity's relocation and compensation functions would be performed in tandem with FCC equipment authorization rules mandating participation in the Entity's relocation compensation



protect fixed microwave operations from harmful interference during interim deployment, the Entity clearly advances the objectives of Section 332. Moreover, the Entity's role is critical to the success of the proposed unlicensed PCS allocation given that implementation of unlicensed PCS cannot be realized until microwave licensees are protected or relocated consistent with Commission requirements.

The Commission's power to recognize the Entity is further supported by analogy to the agency's authority to utilize frequency coordinators for private land mobile services.²⁰ The legislative history of Section 332 makes clear that the FCC possesses broad discretion to include new uses of the radio spectrum within this category to effectuate the principles embodied in subsection (a).²¹ Thus, while unlicensed PCS devices are different from traditional private land mobile services, Section 332 would appear to authorize frequency coordination for such new and distinct uses of radio spectrum.

3. Recommendation: A "Package Approach" Linking Equipment Approval With Frequency Coordination

Under the authority of these provisions, the Commission should recognize the proposed Entity as the frequency coordinator for unlicensed PCS and 2 GHz microwave interference concerns and mandate participation in the relocation cost compensation pool as a condition of securing equipment approval to market or sell unlicensed devices. Those users seeking to deploy non-nomadic unlicensed PCS devices or systems prior to band clearing would also be required to engage in coordination with the Entity prior to deployment.

This approach has several advantages. *First*, it builds upon the existing regulatory frameworks of equipment approval and frequency coordination. As explained above, these mechanisms are firmly entrenched and legally sound means to regulate deployment of new

²⁰ 47 U.S.C. § 332(b)(1).

²¹ See Conference Report No. 765, 97th Cong., 2nd Sess. 54 (1982), *reprinted in* 1982 U.S.C.C.A.N. 2237; 47 U.S.C. § 151.

communications services.²² *Second*, it recognizes that FCC involvement and oversight is critical to the success of a mass relocation effort affecting hundreds of parties and costing millions of dollars. Such involvement helps ensure adequate initial funding and provides a necessary enforcement mechanism against "free riders." *Third*, FCC involvement avoids difficult compliance liability issues that would be attendant to alternatives involving licensing of spectrum to a consortium or other single entity.

D. Functions of Entity

The Entity would need to undertake a variety of functions to facilitate the clearing of the band. These functions include:

1. Securing Initial Capitalization

An immediate task confronting the Entity is the need to secure the substantial start-up financing necessary to commence operations. Various alternatives for structuring the initial financing of the Entity are now being explored with banking and investment groups. Options include capital contributions from "participants" and several forms of debt, both bonds and lines of credit. However, no matter which option ultimately is selected, two key issues must be addressed.

First, any system for participation in funding relocation costs must be fair. Large and small manufacturers alike must be permitted to participate on an equitable basis. For example, all manufacturers could contribute on a per device or per sale basis, rather than on an equal per capita basis which might present problems in ensuring that small manufacturers can participate. Any excess contributions of charter members could be refunded over time.

Second, the system must be comprehensive; free rider problems can only be avoided if *all* those who stand to benefit from band clearing pay an equitable share of the costs involved. As a

²² In addition to the legal authority discussed above, UTAM notes that frequency coordinators have authority to collect fees for services rendered. Consequently, there is clear precedent for conditioning membership on contribution to coordination and relocation costs (and thereby supplementing the equipment approval rules as a source of authority for this enforcement mechanism).

result, a manufacturer would still have to contribute to the relocation fund as a condition of marketing its unlicensed devices or systems until all relocation costs are recovered, capital contributions reimbursed and debt fully retired.

2. Revenue Collection and Administration of Reimbursement Fund

The Entity will be responsible for collecting revenues from its members and distributing those revenues to incumbent microwave users in the proposed unlicensed device spectrum in order to compensate them for relocation costs totalling many millions of dollars. Again, any mechanism adopted must be responsive to the concerns articulated above. Thus, it must (1) raise sufficient funds to support relocation appropriate to the allocation; (2) ensure participation by all manufacturers of unlicensed devices; (3) employ a system of financial contributions that does not preclude participation by smaller entrants; and (4) ensure that providers of the initial contributions pay no more than their fair share and do not subsidize later emerging technology entrants.

3. Administration

The Entity would be responsible for hiring independent management staff. This would provide for centralization of day-to-day decisionmaking and would ensure confidentiality of proprietary and competitively sensitive information. The Entity's managerial staff would also train any in-house staff and obtain and monitor outside consultants as necessary to perform assigned functions. Management would remain subject to the oversight of the Entity through the Board of Directors and membership voting rights.

While the precise scope of reimbursable expenses will be determined largely by the outcome of individual negotiations (*See Relocation Negotiations* below), at a minimum, under an involuntary relocation approach, the Entity would: (1) reimburse all relocation costs, including all engineering, equipment, site and FCC fees, as well as any reasonable additional costs that a microwave licensee may incur as a result of operation in a different band or migration to other media; (2) fund all activities necessary for the implementation of the new facilities, including identification and procurement of new microwave frequencies or other facilities and engineering,

frequency coordination and cost analysis of the complete relocation procedure; and (3) finance the construction of the new microwave system or its alternative and test for comparability to the existing 2 GHz system.

4. Relocation Negotiations

The Entity would also be responsible for negotiating the details of relocating incumbent microwave licensees to alternative spectrum bands. Microwave licensees will negotiate at arms length with the Entity with respect to such issues as ascertaining the costs of relocation, assessing comparability of facilities, assigning construction responsibilities and accommodating related relocation requirements.

5. Construction Oversight and Management

The Entity could oversee and manage the construction of comparable alternative facilities should the parties so agree and in accordance with Commission requirements. Again, the details of assessing comparability and related relocation issues will be addressed largely through the negotiation process.

6. Dispute Resolution

The Entity would provide a centralized forum for resolving interference and/or

device spectrum prior to complete band clearing. Such a function seems particularly appropriate given the Entity's role as a frequency coordinator under 47 U.S.C. § 332.

V. REQUIREMENTS FOR DEPLOYMENT OF UNLICENSED PCS DEVICES AND SYSTEMS

A. The Need For Nomadic/Non-Nomadic Equipment Authorization Procedures

Many unlicensed PCS devices are highly portable or "nomadic" and cannot be broadly introduced into the marketplace until the unlicensed PCS spectrum is completely cleared of fixed microwave users. However, limited deployment of certain devices and systems on a spectrum sharing basis could be permitted during the relocation process, subject to non-interference and coordination requirements. Such deployment is potentially advantageous for several reasons. *First*, early deployment enables the public benefits of unlicensed PCS to be made available sooner rather than later. *Second*, the limited deployment of non-nomadic devices and systems during the interim period will raise revenues so that disbursements to relocating microwave users can begin immediately, expediting the process of band clearing. *Third*, with cost estimates for relocating incumbent licensees expected to reach millions of dollars, some form of interim market making is essential to demonstrate to participating parties and to the financial markets that unlicensed PCS is an economically viable industry.

The first and second points need little explanation. It is uncontrovertible that the public stands to benefit greatly from the early introduction of new unlicensed technologies and services. It is also clear that microwave users and unlicensed PCS proponents alike will benefit from a scheme which allows for full compensation and relocation on an expedited basis.²³ However, the third point, establishing an early market for unlicensed PCS, is an equally important, yet less

²³ See Unlicensed PCS Ad Hoc Committee, Consensus Principle No. 4 ("In order to facilitate the early introduction of unlicensed PCS, relocation of 2 GHz microwave incumbents should commence immediately and be concluded as rapidly as possible.")

acknowledged benefit of expedited deployment. Therefore, we address this issue in greater detail in the section that follows.

B. Financing the Microwave Relocation Process Through Interim Market Making

As discussed above, interim marketing of non-nomadic devices is critical to establishing the public benefits of PCS. But, given that relocating incumbent licensees is a multimillion dollar undertaking, some form of interim "market making" also is essential to demonstrate the financial viability of the industry to both participants and the money markets. Given the substantial sums involved in financing the relocation process and the amount of time it will take to clear the band of all 2 GHz microwave licensees, it clearly is important that manufacturers are afforded the opportunity to prove out demand for their products and services prior to complete band clearing.

Simply put, without a mechanism to begin recovering the cost of relocation, manufacturers may be unwilling or unable to invest the vast sums of money and time necessary to develop and begin manufacturing their products, as well as to negotiate and complete relocation of incumbent licensees. Potential sources of financing likewise may be reluctant to invest in a project which promised only distant and uncertain returns. If unlicensed device manufacturers are barred from marketing or selling any equipment prior to band clearing, deployment of unlicensed PCS will, as a minimum, be delayed significantly.

Therefore, in order to expedite the delivery of unlicensed PCS to the public, secure a sufficient revenue stream for financing the Entity's relocation and compensation activities and ensure the financial viability of the unlicensed PCS industry, the FCC's rules should provide for the early deployment of unlicensed PCS devices and systems that are capable of coordinating spectrum usage with fixed microwave services.²⁴ Below, we suggest rules to govern deployment

²⁴ As discussed in Section IV. C., *supra*, the Commission's type acceptance rules and 47 U.S.C. § 332(b)(1) provide a suitable basis upon which to regulate early deployment of non-nomadic devices and systems. While *all* unlicensed device manufacturers would be required to participate in the cost compensation mechanism established by the Entity as a condition of marketing or selling their equipment, users of non-nomadic devices seeking to deploy their systems prior to full band clearing would also be required to engage in coordination with the Entity prior to deployment.